

# AVIATION WEEK

A MCGRAW-HILL PUBLICATION

MARCH 9, 1953

50 CENTS



## AIR FORCE'S NEWEST MEDIUM BOMBER

Here's the RB-66, Douglas' new twin jet bomber which will be rolling off the line this year at the Douglas Long Beach, California, plant. It will carry a crew of three and is designed to be an extremely high performance aircraft capable of speeds in the 600-700 miles per hour range.

It's a source of considerable satisfaction to us at Honeywell that the Air Force and Douglas selected the remarkably sensitive E-11 Autopilot for the job of making flight on the RB-66 easier and more precise. It's a further source of satisfaction that the Honeywell electronic fuel measurement system, standard equipment on more than 40 types of military and commercial aircraft, was also chosen to provide accurate, dependable fuel measurement so vital to increased aircraft utility.

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1911 to 1912 to 1913 to 1914  
Delinquents coming from 1910s  
1911 to 1912 to 1913 to 1914  
back to 1910s arrested

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The Boeing B-47, discarded, is put out to replace its equal in size and strength with B F Goodrich pressure-testing rig: seals. Other include the Cooper B-46, Lockheed F-104.

Other BFG products for aviation include tires, wheels and jacking, bonded rubber, De Ioris, Avium, Fluorblack adhesives, inflatable seals, fuel cells, Avium, Aviumox, The S.F. Goodrich Co., Akron-based Division, Akron, Ohio.

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## WHO'S WHERE

### In the Front Office

Stan D. Levin has been elected a vice president of Conquest Wright Corp., building the Wood Ridge, N. J., company's Eagle Division.

J. F. Donald Gager has been elected vice president and general manager of East Coast Aeronautics, Inc., Pelham, N. Y.

Bert G. Cox and Kerren Karg have been named senior vice presidents of Hill and Krombein, Inc., New York.

Henry K. Kline is the new executive vice president of Tietjen, Inc., Newark, N. J.

Also promoted recently by the seventh new very successful company are George K. Kline, vice president in charge of production, and John S. Phillips, vice president for engineering and sales.

Lee S. Sullivan has been appointed vice president of Automobile and Aero Sales Co., Inc., San Jose, California.

M. A. Tove, former pilot engineer at Aircraft Products Corp., has been named a vice president of East Engineering Co., Connecticut.

Robert H. Wharton has been appointed assistant to the president at Delta Air Lines.

### Changes

Frank Boushke has been promoted to senior director of Time World Airlines.

Ronald W. Furey is general manager of General Electric's recently acquired guided missile department, Schenectady, N. Y.

David K. Lee has been named to head GE's new aircraft products department, Johnson City, N. Y.

Clara L. Kuhn has joined East Aeronautical Co., San Diego, as assistant director of engineering.

Frederick D. Boushke has been appointed assistant manager of Fox Aeronautics World Aircraft Latin American Division.

Other FAA changes include Richard M. Adams, representative of the Boushke division, and Edward W. Lerner, chief pilot engineer of the Pacific-Northwest Division.

William F. Korne, assistant to the Latin American Division manager.

### Honors and Elections

J. H. Cammish, president of Capital Airlines, has been appointed to the advisory committee of the National Advisory Committee on Aeronautics.

Paul Clark B. McKinnis, Henry W. Lerner, Paul E. Miller and Ernest E. Smith, all of the California Institute of Technology, have been recognized by the National Advisory Committee on Aeronautics.

Stanley H. NACA's special achievement on solid engines was Dr. A. I. Smoot, division chief of the institute's jet propulsion laboratory.

John S. Clark, senior research director at Northrop Aircraft, has been elected chairman of the advisory relations committee of Aircraft Industries Association.

## INDUSTRY OBSERVER

► Largest employment of aircraft in defense weapons programs is now going on in the Caribbean at Virgin, Puerto Rico, where the Marine Corps is using helicopters, transports and jet fighters in an amphibious assault being simulated about Puerto Rico's defense weapons. Marines believe current development of a hostile beachhead by helicopter assault can be successful with offensive or defensive weapons.

► Air National Guard headquarters is becoming concerned over the increased volume of investigative reports indicating lack of air transportation between employees of Air Force plants and subcontractors. Official warnings on the grounds of Public Law 515, Section 51, Title 41, prohibiting loss, destruction or disclosure to prime contractor employees from subcontractors on government contracts, have been sent by AMIC to the aircraft industry.

► Douglas C-119A recently used as the Presidential transport "Independence" is being overhauled at Santa Monica and will be returned to USAF soon where it will be used as the Chief of Staff's personal transport.

► Lockheed Constellation now used as President Eisenhower's personal transport is a Model 749 formerly used by USAF Secretary of Defense. Before its USAF service, the plane was used by Lockheed Aircraft Service Corp. to maintain communications with Refueling Airlift in Ireland. LSA operated the Ireland field for some time under military contract.

► Boeing has delivered the last of its famous Superfort piston-engine-powered bombers. Total of 4,250 B-29 and B-50 bombers were built by Boeing and its business during the last 10 years. Last Superfort delivered was a TB-90H, four-engine transport turbo-propeller transport.

► De Havilland has resumed flight testing of its DH-119 night fighter. For the first time since a prototype crashed in the 1952 SR-71 Firebomber show, killing test pilot John Deere, has observer and 10 spectators.

► Vulcan V-1000 jet transport is planned in two versions: a domestic version of 180,000 lb. maximum gross weight, and an international version with 220,000 lb. gross weight. Fuel powerplants will be 9,500-hp-thrust. Conversion with an increase to 11,500 lb. thrust planned for later versions of this high-bypass engine. Airframe is being designed to accommodate engines delivering up to 15,000 lb. thrust and will incorporate leading edge auxiliary wing tanks similar to those on the Conquest 3 to get a 3,600 mi. range.

► Boeing expects TB-51 to be in the plant for modifications at Seattle while the NB-52 enters ship contracts to fly flight tests. Indications are that the TB-52 light jet engine is well ahead of the comparable NB-47 light jet program in 1957.

► Trouble with an auto-ignition causing crash on the American Airlines' Conquest which made a safe emergency landing at Ford Beach, N. Y., recently was a factor in the following fatalities: the airplane experienced a three-position switch panel was used with a two-position on-off switch. Result was that pilot turned the switch on when he thought it was turning off, and vice versa, according to engineers involved in the accident. The engine was from the American Airlines base at Tulsa has a complete servicing job on the propeller covers. Original cause of failure loss of power in the left engine, which resulted in pilot bailing out, the feathering switch the fuel flow, has not been located. Nip the switch switch panel installation been exposed.

► Douglas Aircraft is now testing a new device that will link the radio-communicator directly with control surface subcontrol mechanisms on the North American F-105 and enable the aircraft to track down its targets automatically, using the human pilot only as a monitor of the system. The Lockheed F-94C is also being engaged to perform target interception automatically.

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## Domestic

Boeing Aircraft DC-6A set a new one-stop coast-to-coast speed record for scheduled last week, flying 3,575 mi. from Los Angeles to New York in 7 hr., 45 min. at an average speed of 393 mph. The transport carried 27,000 lb. of miscellaneous cargo.

Roger Lewis, sales manager for Cessna Wing-C, was expected last week to be nominated for the winning post in Aircraft Air Secretary.

An F-86 Scorpion Hawk T-100 is expected to arrive early this week in Washington after a quick trip to Korea to receive a briefing from USAF field commanders as the combat situation prepares to face Congress on the AF budget for fiscal 1954.

Boeing C-97 modification is a hospital transport is being started by Ticon Aircraft Corp. at its Greenwood, Tex., overhaul division, since production order for conversion of a large fleet of C-97s to an evacuation configuration expected to follow the prototype. In Dallas, Texas, in converting major engine, various plans and two-engine, four-place executive aircraft under a \$4.9-million contract with Riley Aircraft, Manufacturing, Ft. Lauderdale, Fla.

Fuselage's YB-24 World Here is undergoing tests at temperatures of -65 deg. in a refrigerated hangar at Eglin Air Force Base, Fla. This aircraft is scheduled to be tested by Air Research Service under actual polar conditions at the Arctic.

More than 5,000 vehicles are ordered by Fairchild Aircraft Division in its Hagerstown, Md., plants, exceeding the World War II peak of 3,270.

Edward M. Swan, 53, appointed to the vice president of American Airlines, died Feb. 25 in New York home.

Los Angeles International Airport has added the Secretary of Treasury to designate it as a federal airport of entry, arguing that most foreign flights now must bypass Los Angeles in close special permission to land.

Corporation Aircraft Owners Assn. board of directors may change the organization's name at its next meeting in Association of Business Aircraft.

Earl B. Ortmann, famed test pilot and several times competitor for the Na-

## NEWS DIGEST



COASTAL HELICOPTER developed by Goodyear Co. of America is pictured during May flight tests, recently completed at the company's St. James, N. Y., heliport. It is

the first coastal carrier to pass such tests by specifications. New test data indicate that a year of tests will be made available to the Air Force and Army.

Donald Air Route Thompson Temple, died at Miami, Fla., Feb. 27 of a heart ailment.

Duke W. Bennett, former Civil Aeronautics Board chairman, has organized the Texas Auto Transport Co. in Oklahoma City. He is president of the new firm.

Standard Aircraft Equipment Co., Minneapolis, N. Y., received a Civil Aeronautics Board certificate last week to operate all types of plane instruments and accessories, believed to be the first full-coverage permit granted to the New York state under CAR's new report station regulations.

Inter-airline negotiations failed last January through various changes in Washington totaling \$15,155,307, a 26% increase over the same period last year.

Aircraft shipments in January totaled 275 one to 10-place personal and executive planes at an overall value of \$2,763,000, Aircraft Industries Assn. of America reports.

Civil aircraft exports added up to 24 planes in January 1953, declining from last year's average of 30 units per month.

## Financial

Corbin-Wright Corp., Wood Ridge, N. J., reports a net income for 1952 of

\$2,047,514 from military and commercial sales totaling \$35,183,643, an increase of 87% over last year.

Colwell Airlines earned a net profit of \$5,000 during the first month of this year.

Northwest Airlines showed a net loss last January of \$316,546, accounting expense totaled \$4,709,681, compared with total operating revenues of \$4,093,105 and a tax adjustment credit of \$394,200.

New York Airways, Flushing, N. Y., recently sold 85,016 shares of previously unissued stock for \$1,100,625. The company had 236,350 shares of capital stock outstanding as of Jan. 31.

Swiss Airlines receipts in 1952 add up to approximately \$15.4 million, according to the airline's annual report.

## International

Swiss growth in a worldwide air traffic last year is reflected in a total of \$218,246,000 in transactions paid through International Air Traffic Assn's clearing house in London—a 28% increase over 1951, IATA reports.

Construction of a new all-weather jet fighter, designed by Aero Canada has spent up to 1,148 mph, is being designed while the Canadian government decides whether to invest \$70 million in a prototype and production of the aircraft.



## Flying staff car

This rugged twin engine Beechcraft operated by the Army Ground Force comes too, has a top speed of over 200 mph and a range of 1135 miles. It delivers the versatile, exceptionally dependable performance characteristic of Beech planes.

With Army designation L-23A, it is a modification of the brilliantly engineered Beech Twin-Bonanza. The L-23A is one of many Beech military planes now in production. Beech Aircraft Corp., Wichita, Kansas, U.S.A.

**Beechcraft**

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**LATEST VERSION OF CP-300**—An early production Army Canada CP-300 two-place all-weather fighter in the new MR-6 configuration with latest nose housing improved radar. Production models will be all rocket armed. Craft has been directed post-Mark 1 as second batch.

## Foreign Aircraft News in Pictures



**NEW FRENCH REE TRAINER**—Morane-Saulnier M.S. 755 (above) works its first flight Jan. 29 near Paris. Featuring a T-tail, the craft seats two side by side and is powered by two Turbomeca Melrose 2 jets of 870 lb. thrust each. Gross weight is approximately 6,000 lb.

**FOUCA MAGISTER ALPOT**—The C.M. 106 (below) two-place biplane French get trainer features a large V-tail.

**NEW SPANISH TRAINER**—Beechcraft 1115 (below) is all wood and is powered by a 150 hp. engine. Top speed is 142 mph.



## Washington Roundup

### Money Developments

Funds for Air Force and Naval Aviation for the coming 1954 fiscal year face a rough road in Congress, according to indications so far.

Chairman John Taber of House Appropriations Committee, leading advocate of steep cuts, has taken a firm hold on the reins of his committee. Without consulting members, he has issued a staff of 10 to 75 assignments and accompanying requests to study out recommendations. Their identity and activities are being kept secret, even from some committee members. But it is understood more have been assigned to the defense budget. Mrs. Maura, national general manager of Associated Press Division of General Motors, is understood to be one of the experts assigned by Taber.

Chairman Dewey Short, with the support of his Armed Services Committee, is ready to hold the line against too deep slashes in defense funds integrated from Appropriation House Committee. Short, chairman of "Dingell," the largest bloc in the federal budget, is going to have to take his share of cuts under the Republican economy program. But he must use a scalpel and not an axe. "I don't see how Truman's \$41-billion defense budget can possibly be cut below \$15 billion, and that is probably too much. Our present goals, including a 143-wing Air Force, must not be reduced."

Secretary of Defense Charles Wilson generally is expected to support new funds proposed by former President Truman's budget. It was drawn under the direction of Assistant Secretary W. J. McNair, whom Wilson has advised on his tenure. Truman requested new funds for USAF and Naval aircraft and related equipment of \$8.9 billion, compared with the 1952 \$16.6 billion.

Undersecretary Roger Ross is making serious to determine the advisability of further reductions in military programs. These might lead to accommodations for reduction in the \$9 billion expenditure for aircraft procurement the Truman budget contemplated. Approval of USAF and Navy against reductions is that they increase and costs and delay achievement of necessary combat strength.

Democratic Rep. George Mahon, former chairman of the Appropriations Subcommittee on Defense, also indicated that the military budget has pointed themselves. Facing out that 60% of even military dollar goes to procurement, he contends in Ross speech that the new defense program should not only be maintaining but on contrast previous and profits to business. He said:

"To reform in the past, almost countless billions and untold millions have been going out and making their way with big business and the taxpayer has paid the penalty of increased costs. If this Wilson regime will, whenever necessary, crack the heads of big business above the profits to big manufacturers and forget any slightest they may have had to business colleagues who remain out of government, the prospects for good management and cheaper defense costs should be bright."

### Raising the Curtain

First break through in the wall of silence at Defense Department since the new administration took over Jan. 20 will be a press conference by Secretary Wilson this week or next.

Wilson is inclined to follow the example of the President and Secretary of State and hold regular weekly con-

ferences to keep the public informed and keep public support for defense activities. That, as a politician, he has indicated he will hold conferences on alternate weeks.

Wilson also has taken the position that the senior executives should have a wide area of operating policy for their departments, even if it might be at odds with overall policy.

Secretary for Air Harold Talbot plans to start weekly press conferences shortly.

Secretary for Navy Robert Anderson doesn't plan new interviews or other public exposures "for some time yet."

### Subsidy Separation Law Out?

There's a strong move, supported by Air Transport Association, to hold off consideration of legislation separating subsidy from annual pay.

This is the three-point airline position as outlined in a memo circulated among congressmen:

As in the past, the airlines continue to support "fair and equitable" subsidy separation legislation.

But, since Civil Aeronautics Board has completed its report which shows the amount of subsidy and the amount of cost cooperation in total and by individual carrier, it is possible for both the executive branch of the government and the Congress to determine how much the airlines are being subsidized and how much they are being paid at service pay for the carriage of mail and "the basic objective of subsidy separation legislation has thus been achieved."

"This being the case, action on subsidy separation bills should be deferred until it appears that the Board's reports do not adequately serve the purpose of subsidy separation."

Opposition comes from congressmen who want Congress to have the choice each year to knock out money for airline subsidies. Legislation of the type sponsored by Sen. John Kennedy and Rep. John Dingell would make this possible. But the consensus is that this is not legal under the present system in which subsidy is appropriated as "annual pay."

### Here and There

Senate Small Business Subcommittee has revised the Civil Aeronautics Board to a session Mar. 17 to ask Board members what they have done to keep markets in business. Members of the subcommittee include Sen. Edward Tamm (chairman), Robert Hennrichsen, Charles Tobey, Lester Hunt, George Southern, Talley, Hunt and Swickard, who are members of Senate Interstate Commerce Committee, with participation over commercial aviation.

Single regulatory agency, as abolition of CAB and requirement of airline separation to Interstate Commerce Commission, seems to be definitely out. Among other developments like Railroad and other railroads are being the long-time solid front of these lines in favor of the proposition.

User charges. A study outlining government financed facilities for all types of transportation—comb, waterways, etc., as well as aviation facilities—is due for submission to Congress shortly. It will recommend a general policy for assessing users of all types to reimburse the government expenditures. Thus in the approach that has been taken by the air transport industry which has observed to being might out for assessments.

—Kathleen Johnson



DOUGLAS NF-104 INTRUDER, seen in new flight news here and on page 16, is considered one of the most advanced interceptors. It has delta-division designed as intercepter, yet level wing features permit short takeoffs and landings. Delta-division separation is visible.

## Douglas Aircraft Backlog Tops \$2 Billion

- Record military and commercial plane production, sales and profits push net worth to all-time peak.
- Supersonic A-4D attack bomber design is well advanced, and \$1 million to spent for jet liner development.

By Robert Hutz

A record positive year in sales, profit and production was reported by the Douglas Aircraft Co., Inc., for its 1952 fiscal year ended last Nov. 30.

Net profit increased 63% to \$10,782,255 for an average of \$8.99 per share, compared with \$6,512,829 and \$5.76 per share for 1951.

Stock increased by 13% to \$512,419,496, compared to \$453,773,125 for 1951.

Douglas entered 1953 with a record backlog of orders and letters of intent of \$2,655 million. This compares with its peak World War II backlog of \$3.9 billion accumulated late in 1943.

Among new developments revealed in the annual report were:

• USAF has ordered serial production of the sweeping B-66 bomber at the Tulsa plant.

• New transport military transport (C-124C) in order development.

• Special Skyraider (AD-4B) equipped

to deliver "special weapons," believed to be small atomic bombs, are being produced at El Segundo.

Design of a new supersonic Navy attack bomber (A-10) is well advanced on the El Segundo drawing boards.

• S-1 research plane is the "world's first man-carrying aircraft" designed to take off under its own power and operate at sustained supersonic speeds in level flight.

• More than 11 million sq. ft. of plant area are now encompassed in the Douglas complex.

• Net worth of Douglas reached an all time high of \$57,693,800 compared to \$51,919 per share of stock.

• \$1 million has been spent on developing a jet transport design.

Witnessing Douglas achievements for its 31st year of operations, president Donald W. Douglas modestly noted that in "many aspects the fiscal 1952 year was outstanding and highly satisfactory" and that "our products and position in the industry improved."

Entering 1953 Douglas had four ep-

ending divisions—Santa Monica, El Segundo and Long Beach in California and Tulsa, Okla.—producing 30 distinct models of military aircraft and three types of transports for the commercial market. About 13% of total Douglas sales for 1952 represented commercial business.

Douglas now has one of the most diversified production programs in the aircraft industry, covering USAF, Navy and commercial markets.

Here is the new 1953 production picture he developed:

• El Segundo—This division—with a production-engineering team headed by general manager T. E. Springer and chief engineer E. J. Hennrichsen—has produced a brilliant array of Naval aircraft. Production activity still is the rugged Skyraider series, which has reached the A-4D modification—

"cleaned up" version of the A-4D also equipped with special gas for ground support work. Also in production is the AD-4B, a modification of the basic A-4D equipped to carry "special weapons," a term generally used by the military to denote nuclear "bombs" atomic bombs. It is believed that some AD-4Bs are already in service aboard Navy's largest carriers.

During 1953, this division will prepare to put into production:

• F4D, a two-engine fighter design that



SKYRAY INTER-PICTOR breaks a film inter-ception. Two-planet is a Westinghouse J40-WE-4 at 7,800 lb. thrust, but main power del J40-M-4 with otherwise may also be kind. Dodge motor del J40-M-4 with otherwise may also be kind. Dodge motor del J40-M-4 with otherwise may also be kind. Dodge motor del J40-M-4 with otherwise may also be kind.

already has calculated aircraft flight performance despite use of a lower-powered engine than originally planned. Indications are that the Navy is planning a production program for this aircraft that is relatively large by Navy standards.

• **A1D**, a swept-wing carrier-based twin jet attack bomber. The A1D is scheduled to become the Navy's first jet attack bomber. Prototype now flying is powered by two Westinghouse carbide model J40 turbojets, but production models will use the Pratt & Whitney F4J.

• **A2D**, a tail-propeller-powered carrier-based attack bomber. The Skyhawk is intended to supplant the original Sky rocket series in the standard light attack plane with the A2D.

• **Long Range**—like the jets headed by James Stewart, general manager, and J. C. Boudreau, chief engineer, is working on USAF projects. Current work includes:

• **Glennster transport series**. During 1952, production of the D-124 series shifted from A-18-C models. The C-124 is powered by an improved version of the Pratt & Whitney J40 turbojet, which delivers 3,500 hp. Development of the YC-124B, powered by two 5,500-hp Pratt & Whitney T34 turbojets, has reached the point where the prototype is 75% completed and is scheduled to fly late this year.

The design team is developing the C-124B, "an even further improved version contracted to build full-scale development of the tail-propeller concept." The C-124B still is in preliminary design stage but will feature a completely preformed fuselage and more powerful turbojets.

Douglas also is working on a much larger military transport aimed at carrying 100,000 lb. payload.

• **B-56 bomber series**. This design, a modification according to USAF specifications of the basic A30 configuration,

will be built in two versions: the RB-56 photo-reconnaissance plane and the B-56 light bomber. Production versions of the B-56 series will be powered by two Allison J71 turbojets of about 3,500 lb. thrust. The B-56 series is currently in advanced development with the Tactical Air Command for use in ground support.

• **South America**—L. A. Curtis, general manager, and J. E. Dandley, chief engineer, are concerned primarily with commercial transport production and development. This division delivered 59 DC-4B commercial transports during 1952, in addition to a quantity of USAF C-119 and Navy N4D versions of the same design. Production at Santa Monica was more than double the 1951 output and is scheduled for a further 55% increase in 1953 as deliveries of the DC-6A commercial airliner and the DC-7 Wright compound engine are under way on numerous contracts of Navy N4D transports to Super DC-7 types also in contracting at the Santa Monica Division.

Initial delivery of the DC-7 is scheduled for this summer. Since the DC-6 series was introduced in 1946, Douglas has received 415 orders including 174 original DC-6 models, 27 DC-6A engine orders, 174 DC-6B and 35 DC-7. Contracts were signed with 15 airlines during 1952, calling for deliveries of 114 commercial airplanes.

• **Tales-T-124**, headed by general manager H. E. Woodhead and chief engineer D. E. Dandley, is concerned solely with modification and production of Boeing designed B-47. First T-124 built in 1947. Dec. 17.

• **Graded Mustang**—Two models of existing models were in limited production at Douglas during 1952 increasing 60% increase in activity in this field in 1951. Additional model numbers were received from Army Ordnance, Navy and USAF, Western Electric, Sperry and General Electric. Douglas

is working on 15 different model projects, including a new type of aircraft to further develop on which, the report says, "it is believed aircraft manufacturers now seem to be relaxed."

## Air Force to Sell Excess Equipment

Air Force is planning to dispose of all its excess equipment stored by Air Materiel Command at various warehouses throughout the country. Even things from airplanes to machine tools and aircraft engines worth millions of dollars will be disposed of soon.

Other armed services and federal agencies will get first crack at the surplus equipment property. That which remains after government agencies have survived the material will go on public sale. One of the first sales will be at Muscatine, Ia., where 218 machine tools, which Air Force has stored at Government Aircraft Plant No. 1 will go on the auction block May 31.

The tools are the remainder of 40,000 machine tools stored at Muscatine and Omaha, Neb., during World War II and later reported by Air Force contractors. They are obsolescent but future production and are not needed by any government agency.

By disposing of its excess, Air Force will relieve the critical need for warehouse space. Supplies has built up over Air Force stopped all annual disposal at the material of the Korean war in order to evaluate its combat needs.

Inspection of the surplus tools at Muscatine may be made June 16-17, prior to the public sale, by any proper title holder.

But forces and machine tools will be available at the sale site as can be obtained by visiting to U. S. Air Force, Post Clearance Office, 15 The Terrace, Ga. Ave., Government Aircraft Plant No. 6, Muscatine, Ia.

## New Aeronca

- Company re-enters civil field with twin transport.
- And eight-place plane is slated for 1954 flight.

Aeronca Aircraft Corp., Middletown, Conn., is coming back into the civil aircraft business with a new 100-hp two-engine, pressurized cabin, composite transport, aimed at the rapidly growing business plane market.

Prototype of the new aircraft designed for eight passengers plus a crew of two, is expected already under construction at Middletown, under supervision of veteran airplane designer George A. Page, now Aeronca director of engineering and research.

Sketches of the high-wing transport (showing its close-to-ground landing arrangement and details of its specifications) and estimated performance are already being circulated to business aircraft users.

Cole H. Mayne, chairman of the board of directors of Corporation Airfield Quonset Area and chief pilot in charge of J. I. Case Co., Norwalk, Conn., considers the new Aeronca design one of the two most promising now being offered for future business plane use.

The other is a four-engine executive plane design proposed by North American Aviation (Wentworth West 2, p. 16).

• **Longest Yet**—Aeronca's new venture is the largest civil plane the company has built. Its previous original designs have been confined to four- to five-place and four-place planes, mostly all metal tube and fabric construction. However, Page's long experience in large all metal aircraft design and manufacture at Curtiss-Wright Plant No. 31, Los Angeles and Columbus, Ohio, has been used recently at Aeronca in subcontract production of assemblies and subassemblies for Boeing B-47 and B-52 and Boeing F-105 airplanes. Experience gained in this type of production will be valuable to Aeronca production of the new business plane.

• **Flies in 1954**—John Lawler, Aeronca president, told Aviation Week that the prototype plane probably could be ready for flight some time in 1954 and that it is being built on a flexible schedule, depending on the urgency of other business.

Lawler said the primary business of his company still is military production, but that Aeronca also is interested in contracting in the civil field. The prototype is constructed primarily of aluminum and metal tube, he said, but whether the airplane then goes into mass produc-

and production will depend on the interest that business firms indicate and how it compares with cost built on the line for airplanes.

• **Wright Engine**—The airplane will be powered with two Wright R3320 air-cooled radial engines, rated at up to 1,325 hp with water injection. Estimated performance calls for landing within 2,500 ft. on a 50-ft. obstacle and a single-engine ceiling at 18,000 ft. The airplane is designed to cruise at 280 mph.

The aircraft will have a 53-ft., 4-in. wingspan and will be 46 ft., 4 in. in length. The pressurized cabin will be custom designed and normally will house eight passengers in luxury airline-type seats.

• **Funny A-10**—Shortly after World War II, Aeronca was the largest manufacturer of lightplanes in quantity production, producing two-place planes at the rate of about 40 working days in 1946.

With introduction of the two-place transport market, Aeronca went into the four-place field with a high-wing, four-place model and built 1,116 transport planes for the Army and National Guard. Continued design of the small aircraft market caused abandonment of plans for the two-place, all-metal, two-control plane and for a larger of metal four-place plane. Finally, Aeronca moved down its list and later built and went on work into military subcontracting production shortly after the Korean war started in mid 1950.

## Reservists Outline MATS Operations

The team of reserve officers, headed by Brig. Gen. A. C. Kesteven of the Pan American World Airways, has recommended these operations procedures for Military Air Transport Service:

- **Reorganization** of major assignments and aircraft scheduling, with each of the three MATS divisions.
- **Close liaison** of transport control, weather and flight-following control.
- **Establishing flight operations units** to provide possible reorganizations by air.
- **More cost training** of pilots as assignment.
- **Standardizing** requirements of open base, traffic and maintenance organization throughout MATS headquarters and division commands.
- **Continued efforts** to make available of all hazardous waste space.
- **MATS operations** in the U. S. Gen. Joseph South suggested the establishment of a committee of commercial air operations experts, from months ago to make the study of MATS (Aviation Week 2, p. 95).
- **Gen. South** says some of these items might be met, but he said, but whether the airplane then goes into mass produc-

## Strikes Threaten Engine Production

Strike threats now aimed at critical aircraft engine production will strike the CIO United Automobile Workers' engine and General Electric jet engine plant at Ely, Ohio, and the Ford engine plant at Chicago.

GE may be struck Nov. 15, when its contract with CIO-CIO Local 647 expires. CIO-GE Local 647 has not yet reached a deal.

CE Local 647, the JET Turbojet, accounted for the B-47 bomber and the F-86 fighter series, both key items in USAF production programs. Ford's Local 647 produces the B-56 bomber and USAF light transport and is looking for 1957 jet production, a key engine in USAF plans.

Wages seem to be the main issue in the threatened shuttings. At Ely, Local 647 is insisting that GE match the wages paid by the highest paying aircraft engine makers, which include Ford. It has not specified an exact figure, however, but it is said to be in the range of keeping its wages in line with those paid in the general community at its plant location, in this instance General Motors. It has offered an increase of 10% to 15% on wages, which is a 10% increase in the wages of the workers at the same plant location, in this instance General Motors. It has offered an increase of 10% to 15% on wages, which is a 10% increase in the wages of the workers at the same plant location, in this instance General Motors.

Local 647 is also demanding a union shop, which GE opposes. A strike would be a major blow to the union plant. The local on Feb. 10 voted 1,514 to 85 to authorize its negotiators to call a strike against GE. The Federal Mediation and Conciliation Service has intervened in an effort to prevent a strike.

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## House Gets New Bill Asking NACA Funds

Legislation authorizing \$14.6 million in new facilities for National Aeronautics Administration (NACA) has been introduced by Chairman Dwyer Staff of House Armed Service Committee for:

- **Lowell Flight Propulsion Laboratory**, \$5,114,100 for a rocket engine research facility.
- **Langley Aeronautical Laboratory**, \$4,600,000 for various new wind tunnels, test cells, engine, vehicle, Mach number facility and supersonic tunnel nozzle.
- **Langley Aeronautical Laboratory**, \$5,100,000 for a rocket engine research facility.
- **Langley Aeronautical Laboratory**, \$5,100,000 for a rocket engine research facility.
- **Langley Aeronautical Laboratory**, \$5,100,000 for a rocket engine research facility.





## New Prop Reversal Safeguard

American Airlines has established a three-phase program to solve one of the industry's most vexing problems.

By Alexander McNeely

Any U. S. airline engineering program that puts new safeguards in place is something for other airlines to watch.

Like when American Airlines-Ingersoll U. S. operator of postwar twin-engine and line-engine airlines—starts a "hot" program, exact action requires especially, like to follow its program because of the recognized competence of American's engineering department under William L. Lifford, vice-president engineering, and chief engineer Don Best.

Today American Airlines has been engaged in a three-phase active safeguard program on reversing propeller reversal for more than a year. Studies previously under way were started on an emergency basis the morning after a National Airlines DC-3 crashed at Elizabeth, N. J., Feb. 11, 1972, in an accident attributed to propeller reversal. The emergency Phase I program has long since been completed, but other safeguards still are being installed.

When the program is finished within the next few months, it is hoped that no further accidents thereafter will be about as remote a possibility as reversals at the present.

William Lifford, engineer in charge of the program, outlines it like this:

### •Phase I—Immediate fixes.

1. Immediate "bleed clamping" has completed action to separate a hot wire to the reverse solenoid in a separate circuit to the thrust.

2. Indications were received that low-pitch stop had failed in some recent turbine and turbine pitch bearings of situations that caused the spring to retract. A bearing spring was corrected immediately.

3. Before the Elizabeth crash, fuel clamping when already was underway to check throttle ranging by a checked clock in maintenance.

### •Phase II—Quick fixes.

1. Isolation of hot wire from reverse solenoid beyond the thrust to the cockpit was continued.

2. Improvement of radio-televise cable was made so that reverse safety switch would give secondary protection. This would mean two leads instead of one would be necessary to reverse propellers.

3. Third switch was added, independent of the thrust. Action at switch is actuated by the thrust lock device when triggered by the landing gear switch, which pulls the reverse solenoid and prevents reversing.

4. Safety buses were revised with arrangements allowing no single fault to cause reversal.

5. Isolation of the hot wire was extended by additional electric connector plugs at several points.

6. Wiring of reverse solenoid was changed to make it a two-wire system, after isolating the positive lead. This means the negative side of the system was not grounded and provided control for both sides of the current. The re-arrangement provides vulnerability to a short-circuit around about four times. To get a reversal automatically with the new system, would require a hot short to the hot lead and a negative short current to the negative lead.

7. DC-6 lights were run to establish the probability of propeller reversal with the low pitch stops installed. Under low power conditions, reversal situation usually results in deteriorated conditions instantly to cut off the engine before propeller goes into complete reversal.

The flight tests indicated that with failure of low pitch stop, it is possible for the governor to take the propeller into reverse pitch when the plane is operating at very low speed and at low throttle.

The opening instructions to engine with (indicated) thrust were revised on the basis of these flight tests.

8. Possibility of fabricating the wing engine, indicated in the National DC-6 crash, pointed out the need for reverse-pitch warning lights. Installation of lights was ordered. Lights are actuated by blade switch, which indicates when the propeller is about five degrees from full reverse.

The American engineering phases fly does not stop; that the early warning light advantages advanced by some other engineers through the disadvantages.

### •Phase III—Long term fixes.

1. Proposal is a relief valve arrangement in the low pitch control and a blocking valve that can close were suggested by American to Hamilton Standard Division of United Aircraft Corp. in line with the relief valve principle proposed by Air Line Pilot Association.

American considered at a clear job and a good design but they further study questioned the low pitch relief valve's merit in bringing about additional safety.

It was felt that the valve added nothing to already asked electrical problems and that no serious hydraulic problems were indicated.

Leverage and the reverse solenoid valve of the current type had a variable fan factor. A double action is involved that opens the valve and closes a diaphragm. The diaphragm will not keep pressure down even should the valve happen to malfunction.

But American engineers haven't closed their books on the relief valve arrangement and are studying its possibilities further.

Recently, the airline asked Civil Aeronautics Administration for approval of another device designed to prevent reversal happening permanently on the ground.

This could happen from a bounce during a hard landing or when a suggested landing gear Micro switch might unlock the thrust reverse lock.

The proposal is to install a disarming switch at the thrust lock circuit. The switch would be located on the pilot pedestal, available to each of both pilot and co-pilot. It would be closed and armed at takeoff. This would leave the thrust unlocked and ready for reversing if an allowed takeoff became necessary.

Prevention calls for the switch to be opened when the plane is before disarming the system even if the landing gear Micro switch should become grounded.

When the plane makes another landing, the switch would not be closed until which were on the ground—this means that the lock would not be released to permit guarantee reversing of the plane because. When the switch is closed, the Micro switch would have acted at takeoff, so that the thrust lock would be released at the same instant.

Lifford explains that American is trying to get in much standardization as possible in the industry by having its Douglas DC-3s and Convair 440s. Both types have the same thrust stop thrust.

The disarming switch is performed even but in glass-type thrust lock—made at National Airlines and some other engineers are advocating—because there is a problem of designing plans to fit the thrust action of the Convair and the DC-3.

There is another real advantage of disarming switch installation: elimination of cluttering of the thrust lock, coming on and off during takeoff due to the vertical "bump" of the landing gear.

UNIVERSAL  
POWER PACKAGE  
HAS MANY  
APPLICATIONS

Mounting Bracket

Power Take-off

Air Pumps

## TECHNICAL DATA

Weight, complete—315 lbs.

Dimensions—21 1/2" x 41 1/2" x 21 1/2"

Operates in ambient temperatures up to 125° F.

Conforms to AS-M42 and AS-101 MIL. specs.

Completely self-contained... This rotary motor package, designed and built by EEMCO, contains the following elements in an integral metal enclosure: Motor, main motor filter, magnetic clutch and brake, zero speed detection driving power take-off for opening valves and selected trim tabs. Auxiliary gear opening adjustable limit switches to control thrust, light switches and position indicator.

Variable... A few of the many possible power unit control combinations are illustrated. It can also drive a drive motor or have a type enclosure through a flexible shaft end shaft installation who is approved not permit complete line or rotary action for units.

Variable power and speed... Changes in motor winding, levered shaft length and gear ratios permit a wide variation in power and speed without modification of the package. Variations in positioning and pulsing are possible by change of gear ratios in auxiliary gear box.

Mounting bracket and AM complete unit can be located in various positions on the container to provide additional flexibility.

ELECTRICAL ENGINEERING AND MANUFACTURING CORP.

4012 WEST JEFFERSON BOULEVARD • LOS ANGELES 16, CALIFORNIA



## How NAA Revitalizes Our

offer tonight 2,000 common shares, making a total holding of 9,000 shares; Joseph E. Smith, officer and director, tonight 2,000 common shares, making a total holding of 11,000 shares; and Marvin W. Smith, Jr., director and officer, tonight 1,000 common shares, making a total holding of 12,000 shares.

• **Empire Water Gas, Inc.** James E. Charlton, director and 170 common shares, making a total holding of 170 shares.

• **Glenn E. Smith Co.** G. E. Smith, officer and director, tonight 2,000 common shares, making a total holding of 2,000 shares.

• **Manitowish-Whitewater Regulator Co.** J. E. Whitman, officer and director, tonight 100 common shares, making a total holding of 100 shares.

• **Midland Airlines, Inc.** J. M. P. Smith, officer and director, tonight 2,000 common shares, making a total holding of 2,000 shares.

• **Northwestern Airlines, Inc.** J. M. P. Smith, officer and director, tonight 2,000 common shares, making a total holding of 2,000 shares.

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### STRIPPING

preparing plastic film from various F-86s, preparing to send place to shops for extensive overhaul and modification.



### HOISTING

a stripped Sabre in its wooden cradle is done with two big lifts. It will be towed to its test station where overhaul starts.



### OVERHAULING

a batch of Sabres on the ramp at NAA's Fermo, Calif., modification line. F-86s are now scheduled here.

## War-Weary Combat F-86s From Korea

North American Aviation is modernizing earlier versions of its F-86 Sabre at a special modification center at Fermo, Calif. The center gives new life to 1,300 planes and is headed by L. S. Watt, general administrator.

The Fermo center has been handling a massed bag of Sabres, including war-weary combat planes airlifted back to California from Korea. Canadian-built models manufactured by Canadian at Montreal, and early models used in advanced fighter training.

Since '60 Canadian-built F-86s were rolled through the Fermo center to meet an acute shortage of Sabres in the two USAF fighter-interceptor wings battling Russian MIG-19s over Korea. The Canadian planes were equipped with latest type of USAF radar, electronic and cockpit equipment and loaded to Korea about a Navy carrier.

New England-Sabre returned from Korea are taken apart completely and put through a modification line where they receive the latest electronic, radar and armament systems. New General Electric J47 turbojet turbofans of considerably higher thrust than those first used in Korea are installed.

Some control modifications also are made, but the flying test that has been featured on all models beginning with the F-86B is not added to the earlier F-86As that go through the line. The flying test will show whether the new edge aerodynamic wing plan (Aeronautics Week Jan. 16, p. 11) have increased materially the controllability of the Sabre at speeds speeds reached in Korean combat.

Korean return Sabres that already have gone through the Fermo line have a total of 6 MGs left in their credit, 43 problems and 11 damaged.

In addition to the Sabre modifications, North American also is modernizing World War II F-6 advanced trainers into the new T-60s used by USAF as primary trainers.

Other production-North American's main plant at Inglewood is producing the P-50D night-fighter version of the Sabre and the latest day-fighter version.

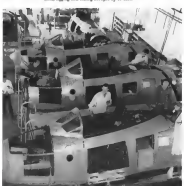
The F-102's Navy's original-built version of the Sabre is being delivered from NAA's Culmstock, Calif., plant. A later version, the F-102 powered by a Wright J45 7,700-lb thrust turbojet, is scheduled for production by early next year.

At Inglewood, North American is developing the F-100, a successor to the Sabre with a 45-deg wing sweepback and a P-50A J45 7,700-lb thrust turbojet with afterburner.



### CANOPIES

perfect wipers blow out's lost, as these planes have electrical methods, rigging and being brought up to date.



### SABRE

forward fuselage sections get instrument overhaul and latest radar and other electronic equipment. Note close studying of plans.

Corrosion and airplanes just don't go together—especially not when aircraft is flying faster than sound, where every stress and every strain is magnified to far greater significance than ever before.

About the best way to fight corrosion, to keep it from destroying metal surfaces and joints, is to whip it at the outset, before it gets a foothold.

To help aircraft manufacturers in their continuing war on metal corrosion, 3M developed EC-843—a sprayable coating that acts as a tough, flexible film which protects flat surfaces, joints, and even dissimilar metal unions against the effects of corrosion.

See what collections can do for you . . .

Perhaps you can use EC-845 in your operation? To learn more about it, and other 3M products designed for the aircraft industry, call in your 3M salesman. Or, write directly to 3M for a detailed booklet describing applications. Address: 3M, Dept. 113, 411 Penrose Avenue, Detroit 26, Michigan.



WAGERS OF <sup>10</sup>COIN<sup>1</sup> BEARD PRODUCE SHIRTLESS ANTIQUE PAPER 1 <sup>10</sup>COIN<sup>1</sup> BEARD SHIRT DETOURING TYPE 2 <sup>10</sup>COIN<sup>1</sup> BEARD  
 COLLECTIVE LOCKTIGHTS W/ <sup>10</sup>W/ ANTIQUE PAPER AND COIN 4 <sup>10</sup>W/ ANTIQUE AND COIN W/ <sup>10</sup>W/ ANTIQUE BEARD W/ <sup>10</sup>W/ COIN W/

### First Cutaways of Doman Rotor System

- Reveal detail makeup of four-blade copter unit.
- Installation to be used on Dornier L25 and YH-31.

These first cutaway views show the detail makeup of key units in Deacon Helicopter's four-blade rotor system.

• **Ta Field Forces**—The U. S. Army Field Forces, through Air Force procurement, have bought a service-test quantity of the YF-51. Initial flight of the copier probably will take place some time this month. Delivery of copiers to the Army Field Forces probably will be made next fall, following GAA certification.

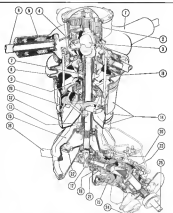
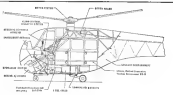
Features of the copier include 7-ft-wide inlet door openings for bulk cargo loading; cockpit location over the engine for observation and accessibility; fluid clutch rotor starting; all pilot controls accessible with shoulder harness in use; interchangeable rotor blades; and tail rotor above external head bracket.

The coiled floor structure is a dual sheet box beam with compartments to accommodate the fuel cells, the battery, electrical regulators, auxiliary fuel pump, landing gear torque shaft and also the ducts for the engine carbon-cleaning system. On the forward end of the floor beam are strings for attachment of engine mount and nose wheel struts.

A twin-engine rotary-wing craft, also projected to use the Dennis rotor system, is now under study for inter-airport and city-to-airport services (Aerospace Week Nov. 18, 1982, p. 18). This ship is now projected to employ two 200-hp, Allison 502 turbines in stead of a single 400-hp piston engine.

► **Rotor Details**—Dennis's rotor system is a novel installation developed after a long R&D research process.

The horizontal rotor measures 48 in. in diameter, with an individual blade area of 18.4 sq. ft. Disk area is 1,800 sq. ft. and effective solidity ratio is 0.087. Rotor rpm is 182.5 (average of

[illegible]





RYAN Q-2 FIREBEE is launched from B-56 bomber and is tracked by two jets.



UNARMED Firebee is special launch drone, after a flight, Q-2 sees the ground.

## Drone Saver

- Q-2's parachute system recovers target jets.
- Equipment undamaged in numerous test drops.

Intact recovery of bones, hijacked jet target planes has been made possible through the joint efforts of Ryan Aeronautical Corp., the USAF and the Forest F. Smith Parachute Co.

Extensive trials of the recovery scheme—a two-stage parachute system—were conducted at McDonnell Air Development Center during development of the Ryan Q-2 Phantom jet drone.

First a simulated target duplicating the Q-2 in general structure and weight was used. Now, the Q-2 itself is being raised aloft in the bomb bay of a Douglas B-56, dropped and put through its paces in recovery. When its fuel runs out, the target drone is taken over by the chute system and recovered intact for reuse.

► **Severe Conditions**—In the first tests, Ryan technicians simulated conditions most severe they encountered in actual service. The chute system had to recover a maximum-weight unit, traveling at maximum speed. But the real drone—the Q-2—begins to see fuel and loses weight the instant it is launched.

In the most extreme experiments, the test vehicle was inflated by a simulated Q-2 launch with full fuel tanks.

► **Combination Details**—The two-stage chute's main canopy is about half the weight of a conventional design parachute of comparable size. It allows after release of a small drag chute.

The chute pulls, from skirt to vent, are formed in the exact shape they take when opened. This repeats the use of less fabric and extra weight. The cloth is a lightweight, high-strength material.

Chute mouth is narrower than the outside diameter, to lower the opening shock load. Both skirts are loaded at all the drone's led surfaces to maximize possibilities of finding.

A sequence timer automatically opens the chute. This timer can be actuated by the "beeper pilot" who operates the remote control box on the ground, governing the target's flight. There is also a separate relay that can be operated from the remote control to release the chute.

► **Operational Steps**—For liftoff, the small control drag chute contracts in a relaxed automatically. Next, the drag chute flies out, bringing the first stage deceleration to the Q-2. After an interval, the main chute contracts as no longer and pulled outward by the drag chute, deploying the main chute from



CIRCUIT TEST VEHICLE is hooked up under B-20 wing. The chute was in inflation.

a bag. The management is such that the response time is shown out before the parachute's canopy can deploy and release.

The immediate pull of the drag chute leads a cord extending from the main chute connector to the base at the rear of the main chute. After the cord breaks, the drag chute leaves the container and deployment bag, while the main chute itself leaves the drone, keeping it level during the descent.

► **Quick Document**—De report, with the ground, a signal link between the chute suspension line and the spin webbing was attached to the drone in automatically disconnected. This separates the chute from the glider and prevents damage which normally would occur if wind picked up the chute and dragged the Firebee drone.

Numerous successful recoveries of the Q-2s have been made, with virtually no damage to delicate internal equipment.

The chute is required to be of such durability as to permit repeated use under the most critical conditions, Ryan reports. The parachute recovery system has been accepted by the Air Force as suitable for the Q-2 platform alone and has been standardized.

► **Program Personnel**—Technical details of the test program were supervised by Ryan's director of engineering, Bruce Swartz, and the Q-2 project engineer, Forest Warner. W. S. Condit directed the actual tests.

Weight Air Development Center personnel assisted Ryan engineers by providing design data, construction features and constructive ideas. The Air Force also supplied launching planes and crew, facilities of the special parachute section for chute packing and proved services for recovery of test vehicles after drops.

## IAS Summaries

Papers on helicopter, boundary layer stabilization and subsonic developments presented at the 131st annual meeting of the Institute of Aeronautical Sciences are summarized on this page and page 32.

These summaries conclude a series of AVIATION WEEK began five weeks ago on the Institute's presentations.

### Rotating Wing Aircraft

(Joint Session in Cooperation with the American Helicopter Society)

► **Effects of Affiliated Rotors**—Document on helicopter behavior, presented by E. J. Rasmussen, Charles W. Rye, III, Ted and Don Egan, Kaman Aircraft Corp.

A theoretical investigation was carried out to determine the influence of an articulated rotor on the dynamic properties of a stabilized helicopter. This investigation indicated that any analysis of a helicopter's attitude stabilization scheme should include the dynamics of the rotor, it also indicated that simplified methods of considering the effects of rotor rotor dynamics were feasible.

In connection with this investigation, an experimental program was carried out. Comparison of predicted and measured behavior characteristics indicated the validity of the simplified methods considered and how the corrections that rotor dynamics should be included in high-gain attitude stabilization systems.

► **Forward Flight Lateral Stability and Flying Qualities**—Studies of the T-44C helicopter, K. E. Auer, Flight Research Div., Langley Aeronautical Lab., NACA.

Results of flight test measurements and corresponding pilot's opinions of the forward flight lateral-directional flying qualities of a tandem helicopter in several adjacent configurations are presented and analyzed. The conclusions are presented in the form of desirable flying qualities plot applicable to all types of helicopter. Comparison between theoretical analysis and experimental results indicates theory to be a useful tool in the study, means to achieve their goals.

### Motorless Flight

► **Investigation of a Wingless, Surface-Driven, Low-Speed, Motorless Flight**—Glenn D. Foster, Aerophysics Dept., Mississippi State College.

Studies of boundary layer stabilization have pointed to the need for a suitable motorless aircraft having reasonably high efficiency and desirable features of low and reference characteristics with respect to motorless aircraft have shown extremely low efficiency, and the present work shows on comparable motorless aircraft systems with respect.

Theoretical and experimental studies were conducted which showed that there could be a motorless aircraft which could be a motorless aircraft. The first type is designated was a windmill in which the action air passed radially through the hollow blades and exhausted at the tips in the

## French Engineers Plan 1953 Meeting

A feature of the twentieth international meeting also in Paris next summer will be the congress of the French Association of Aeronautical Engineers and Technicians (AETA).

The AETA council has chosen production of advances as the subject for discussion at its technical meetings, and a selection paper from engineers throughout the world.

Early issues—available from the society—must be returned by May 1, 1953, and papers submitted by June 15, 1953 if the author cannot make the trip to attend the paper in person, a qualified member of the AETA will

present it, or the author may designate someone himself.

Papers must be written in French, English or Spanish. For translation, the original is in English, German, Italian or Spanish. For this service, papers must be received before May 1, 1953.

Prototype design and mass production, prototype production, mass production planning, manufacturing for mass production, tolerance limits and quality control, and new trends in aircraft production.

Correspondence should be addressed to the secretary, Association Française des Ingénieurs et Techniciens de l'Aéronautique, 6, Rue Cassini, Paris XVI.

# FOUR-FOLD EXPANSION OF



This new burner test stand, located in the Andrew Wilgoos Turbine Laboratory, is typical of the complex new facilities needed for turbojet engine development.

# EXPERIMENTAL FACILITIES

## For New Aircraft Engine Development

TODAY, more than ever, high achievement in aircraft engine development demands tremendous experimental facilities. This is especially true at Pratt & Whitney Aircraft where engines of greater and greater power are being developed for the military and commercial needs of today—and tomorrow.

At the close of World War II, Pratt & Whitney Aircraft was the world's foremost piston engine builder. Naturally its experimental facilities were extensive. But today's broad program in the turbojet, turboprop and ramjet power plant fields has required an enormous increase in such facilities... at a dollar investment four times as great now as in 1945.

Our multi-million dollar Andrew Wilgoos Turbine Laboratory, the most complete privately-owned turbine engine test laboratory in the world, is a major example of these post-war facilities. Here experimental jet engines or individual parts of engines are tested and developed under an infinite variety of temperatures and simulated altitudes. In the Wilgoos Laboratory, and in more than a score of other new laboratories and test facilities, power plant designs of the future are explored and proved.

Constant expansion of experimental facilities is only one aspect of aircraft engine manufacture, but it illustrates an entire industry problem. It helps demonstrate, too, why—today as always—dependable engines take time to build.



The above chart illustrates the huge increase in Pratt & Whitney Aircraft's investment for experimental and test facilities from January 1945 to January 1963. In 1945, we built only piston engines. Today, our program also includes turbojet, turboprop, and ramjet engines. This four-fold expansion covers only experimental and test facilities—it does not include additional heavy investments in new production facilities.

# Pratt & Whitney Aircraft



MAIN OFFICE AND PLANT, EAST HARTFORD, CONNECTICUT

BRANCH PLANTS: NORTH HAVEN, BOURNEMOUTH, JARVIS

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION



member of a centrifugal pump. The type showed efficiencies in excess of 70 per cent.

Theoretical studies were also made of a vorticity with no cavitation, reflecting the loss in the flow. This type indicates the advantage of eliminating the loss from the tangential velocity of the vorticity and the efficiency of the thick vorticity segment in the axial flow type.

► **Flight Measurements of Airplane Trail**  
ing-Edge Section on a Subplane. Airport Report, Army-Air Corps, Mississippi State College.

This paper presents an investigation made on a subplane equipped with a trailing edge section that covers two-thirds of the wing span. Special wing tips were installed and explored for pressure distribution. An experimental section method was used to arrive at a location and shape for the opening in the top upper surface which would yield a high suction pressure. The flow coefficient obtained was of an order that should have satisfied in aerodynamic improvement.

The results obtained in these tests, however, held no promise for application to airplanes in general. No improvement in the lifting ratio was found, but the tests are credited improvement in overall drag. The pressure lift coefficient was not as great as that obtained on a plain wing. Scaling up these measurements of a fully aerodynamic distribution of suction through the trailing edge that yielded a lift coefficient 10 per cent of that developed by the airfoil.

## Fast Writeoffs

Accelerated amortization for new aircraft expanding their defense facilities is granted by the government in the form of certificates of security.

In the following list of recent test results, complete write-off is given, followed by product or service, cost of construction deemed necessary for defense purposes, and the percentage of the equipment cost allowed for test write-off. Test write-off permits projects to be depreciated in six years.

• **Avco Corp.,** Dayton, N. Y., aircraft and engine parts, \$11,175, 85%.

• **Ball Aircraft Corp.,** Fort Worth, aircraft and engine parts, \$11,175, 85%.

• **Boeing Aircraft Corp.,** Wichita, N. Y., aircraft and engine parts, \$11,175, 85%.

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MT. WASHINGTON hoisting, where jet propellers are put through.



KING TREES in hoists (above). Water-spray rig is attached to test duct.

## Jet Engines Tested on Icy Peak

Jet engine manufacturers are putting powerplants through rigorous testing in a special laboratory on the frozen, wind-swept, 5,240-ft. summit of Mt. Washington.

The peak's test station is operated jointly by the Air Force's Research and Development Command and the Navy's Bureau of Aeronautics. A small test bridge on the snow-covered peak is closed to the road. The four months of the year, wind speed ranges from 75 to 110 mph, and it has been known to reach 175 mph. Temperatures have dipped as low as -66 deg.

Jet test engineers welcome the low temperatures and high winds as ideal for their work. Most strong effects jet engines when a plane is descending from 5,000 ft. to sea level at reduced throttle for a landing approach, engineers say. Running a jet on Mt. Washington simulates this condition.

Recently, two General Electric Air

craft Gas Turbine Division engines—Walter Solon and Elmer Packard—completed a three-week research assignment at the isolated station, assessing tests on GE jets and checking actual wing conditions, liquid water content and rate of droplets. Additional tests are scheduled.

Most development work on the engine features of GE's latest "hot nose" jet, the J47-13, was done in the manufacturer's test houses.

In engine tests on prototypes of production jets, engineers determine at what speeds the engine will begin to ice and work out minimum operating conditions. The tests also give an indication whether the engine will comply with AF icing specifications.

Other important test work is the refinement of existing techniques. Development and testing of instruments for detecting icing conditions in engines has been done at this facility.



## CHAMPION SALUTES THE AIRLINES

*for the best safety record in history!*

The nation's airlines set new all-time records in passenger traffic and in safety of air travel for 1952. This is a magnificent tribute to airline maintenance methods and personnel.

It has been the privilege of the Champion Spark Plug Company through its engineers to work closely with the engineering and maintenance staffs of every major airline.

Whatever part Champion Spark Plugs have contributed to greater flying safety is attributable in large measure to the wholehearted cooperation of airline and aircraft engine manufacturing personnel with each other and ourselves. Nowhere is this more evident than in the annual Aircraft and Ignition Conference, sponsored by Champion, which has become the standard of the industry for cooperative effort towards a common goal!

Other important test work is the refinement of existing techniques. Development and testing of instruments for detecting icing conditions in engines has been done at this facility.



The 1952 and 1951 are the most widely used of Champion's many types of aircraft spark plugs.

CHAMPION SPARK PLUG COMPANY, TOLEDO 1, OHIO

TOMORROW'S AIRCRAFT: *One step closer*

**Reducing weight  
while increasing  
structural strength**

New miracles with alloys are today overcoming one of the greatest problems that ever confronted the aviation industry . . . ever-increasing plane weight. As faster and faster speeds were demanded, larger and more powerful engines required, stronger and heavier airplanes became necessary. But Westinghouse engineers had foreseen the difficulties that increases in body and engine weight would bring . . . and their years of metallurgical research and plastic studies had the answer—Titanium and Micaite.

After successfully stressing the use of Titanium for jet engine parts, Westinghouse engineers doubled their efforts to further its application. Today, a saving of over 200 pounds has been made possible in the weight of each engine. Still further savings are being attained with alloys of this miracle metal that boasts greater tensile strength, up to 750° F., than even stainless steel.

At the same time that Westinghouse was unfolding the merits of Titanium to the aviation world, their manufacture of Micaite plane parts was proving almost equally valuable in reducing weight, while increasing structural strength. Research on this "lighter-than-aluminum" material and on its further use, other than stems such as pylons, came, structural members and assemblies, continues without a stop.

Reducing weight and increasing structural strength with these new materials are but two of the hundreds of aviation developments under way in Westinghouse plants and laboratories the country over. Every day some new product, engine or material from one of the plants is announced . . . some new record is set . . . some new goal achieved. Every day come and more eyes are turning to the name Westinghouse for promise of tomorrow's faster, safer, more economical air transportation. Westinghouse Electric Corporation, P. O. Box 688, Pittsburgh 30, Pennsylvania.

10-1000



Use of Titanium in jet engine compressors like this, allows reduction in weight while increasing the structural strength.

**THE SCOPE OF WESTINGHOUSE IN AVIATION**

**Basic aircraft systems**

Engine Ignition, Fuel Control, Radio, Air Systems, Communication Equipment and Electrical Systems.

**Ground equipment**

Wind Tunnels, Airport Lighting, Industrial Plant Apparatus.

**Air frame system components**

Transformers, Rectifiers, Instruments, Generators, Temperature Control Panels, Gas-turbine Engines and System Control, Circuit Breakers, Controllers, Motors, Actuators and Hoses, Electrical Tapes, Magnets, etc.

*"Continued"*

YOU CAN BE SURE...IF IT'S  
**Westinghouse**





## Gaveco Develops New Regulator

Rugged improved unit maintains constant voltage in small alternators, uses sealed plug-in subassemblies.

By Philip Klass

Gaveco Corp. of New York has developed a new environmental proof, easy-to-install version of its older electronic voltage regulator, which the Air Force has been using to maintain constant voltages in small alternators that supply ac power for windshield de-icing and side air in the B-47, B-45, B-50, C-47 and C-54.

Gaveco, building 10 prototype units for Navy evaluation, says one of its new Model TRC-B regulator has lasted up more than 150 hours of flight test time at the USAF's Wright Air Development Center in Dayton.

The new Model TRC-B weighs 25 lb., enough for use in the B-47 and TRC-B models of which Gaveco has produced about 7,000 for the Air Force. The new model, however, employs heretofore sealed plug-in subassembly construction and, in addition, has several new operational features. These are:

- Over-voltage protection
- Automatic field clearance
- Electrical "inching" for flywheel tests
- Operation—The Gaveco regulator is designed for use in aircraft power systems in which each of several small, single-phase alternators operates independently. Each alternator feeds its own separate power bus and leads. The regulator continuously controls its alternator's output, usually set at 115 v.

When alternator voltage varies from the preset value, the regulator automatically increases or decreases current flowing in the field winding of the alternator's motor, which in turn increases or decreases alternator field current to adjust the voltage to its original value. (The action is a small d.c. generator driven from the alternator's motor shaft that amplifies regulator output self-corrects for ac in the alternator's field winding.)

- Performance—Gaveco says its new TRC-B regulator will maintain alternator output (about 250 watts) constant over the alternator's 550 to 900 cps frequency range within:
  - 2 Volts, from no load to 100% load
  - 2.5 Volts, from no load to 175% load
- The Gaveco regulator uses two three-pin-type tubes connected in a full-wave rectifier circuit to control average cas-

trate flowing in the motor field winding. Firing point of the thyristors, which determine the average motor field current, is controlled by the magnitude of the alternator's output voltage.

The regulator consists of four major plug-in type subassemblies, each of which are automatically sealed for protection against corrosion. The interconnections among these subassemblies is also a screw-on replaceable assembly.

• Over-Voltage Protection—The new regulator has a built-in over-voltage device designed to protect equipment operating on the a.c. bus. If a malfunction should cause the alternator voltage to rise to 130 v., for more than approximately 8 1/2 sec., a relay picks up and removes alternator excitation.

The regulator and alternator can be returned to service by pushing a reset button, if over-voltage still exists, the regulator will again trip out.

• Fault Chances—If a fault occurs on one source or a.c. bus, it is desirable to try to "bump clear" the fault so that other engines can continue to operate. When such a fault occurs on a bus fed by a single alternator, voltage drops sharply. Because the alternator regulator operates from this bus voltage, regulator output (field current) falls. This reduces alternator voltage. This makes it impossible to bump clear the fault.

If there is a second (independent) a.c. supply, the faulted bus regulator can be reconnected to the second alternator to obtain operating power. This makes the faulted bus regulator to supply the large field excitation current needed to be faulted alternator if it is to be bump clear the fault.

The new Gaveco regulator is designed to switch automatically to a second a.c. source (if power) for its supply power in the event that a short circuit occurs across its own bus. If the fault is closed promptly, the regulator automatically returns to its own a.c. bus for power; if not, the regulator stays off-line, Gaveco says.

• Electrical Choking—Coil-fired thyristors perform more like on-off switches than conventional vacuum tubes. Thyristors are either completely non-conducting or full-conducting. At the point where the gas in the tube ionizes, it starts "fire with a bang." This



NEW TRC-B VERSION of Gaveco's electronic voltage regulator, and its maintenance-free plug-in subassembly construction.



IS CONSTRUCTED with hermetically sealed plug-in subassemblies to simplify maintenance and protect against moisture.



EVEN INTERCONNECTING wires (shown in underwire view above) are pulled in and can be removed as a complete assembly.

carries high transient voltages that tend to reduce lifetime life.

Gaveco says it has introduced "fast-track chocking" for its regulator thyristors by means of an R.C. (resistor-capacitor) network between the thyristor plate and cathode. As a result, Gaveco expects lifetime life to exceed 500 hrs. One set of tubes under test reportedly lasted for 300 hrs.



I found this the responsible for the structural strength and superior physical properties of RUBATEX—its unique, very low density, closed cellular structure that shuts out oxygen, dirt, moisture, and acts as a barrier against temperature extremes.

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In contrast, too, RUBATEX has uniform resiliency and a tight structure which deadens sound and isolates vibrations. RUBATEX is soft, pliable, and easy to work with—light in weight and will outlast many years other soft rubber products.

For maximum efficiency of your product—check the superior advantages of RUBATEX first!

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FOR AIR THAT PROTECTS—USE RUBATEX





AIR FRANCE'S FLIGHT TRAINER

Curran-Wright assembly line works on electronic flight trainers of the type usually purchased by Air France for instructor training of pilots in exceptional conditions. Air France, reportedly the last foreign cus-

omer to buy such equipment in the U.S., will install the flight simulator at its City Field base, near Paris. Trans World Airlines has also ordered C-19 trainers, plans to install them at seven training centers.

## 78000 FILTER CENTER 83333

► Navy Fighters to Get BME—Radio magnetic indicators (RMI) provide combination of dual ADE and magnetic heading information will go into Navy fighters for the first time, eliminating the panel-mounted gyro compass. First RMI installations, slated for the Douglas F-4D and North American F-12, will use a new Sperry remote gyro compass, designated Type S-2.

► GE Develops Remote Gyro Compass—General Electric, which G-2 panel-mounted gyro compass is being displaced by Navy switch to radio magnetic indicators in its new fighters, has developed a new low-drift remote gyro compass system suitable for RMI conversion. System, which weighs about 20 lb, is at present under test at Navy's Airborne Instruments Lab in Philadelphia.

► Ansonia High in Top Defense Firm—Firm of the 100 companies which received the largest amount of military business since the start of the Korean war are in the reviews and observations business (Aerospace Week Jan. 25, p. 18). Eight of these 15 firms were not in the select "700" dated World War II. Hughes Aircraft, now in the 12nd position, and Collins Radio, now in the 46th spot, lead the list of entrants newcomers to the top 100. Other newcomers: Hamilton, Sykes, Minneapolis-Honeywell, Adams, Collins, and Motorola.

► Lockheed Buys New CEC Computer—Lockheed Aircraft Co. has purchased a new automatic digital computer for use in Convair's latest computer studies used for other airplane designs.

problem. The new computer, whose official name is the CEC 101 Electronic Digital Differential Analyzer, is being produced by the Computer Research Corp.

► Radar Report From S-7 Can—Preliminary report by McGill University's Dr. J. S. Menkoff to Aeronautical Radio Inc. committee preparing spec for an active weather surveillance (stare) system for the S-7 can (see-length) over the water and X-band (12 cm) at 1000 MHz will be used to track 5-10 cm radar wave radar track.



UNDER INSPECTION

Massachusetts inspection is used to assess ability of special purpose systems taken out in inspection, testing, and other aircraft equipment by Pacific Airfield Test Bank located at company's new Easton, N.J., plant.

low vibration, induction of useful range) than S-2 can, radar under test likely to be concentrated in stars.

► MH-1 at Work on New "Helicopter"—Minneapolis-Honeywell, whose F-12 autopilot will be used on the Pave II and HUP-1 helicopter, is also working on a new advanced, light-weight helicopter autopilot. One, the MH-13, is sponsored by Pave II; the other, the F-12, is a Wright Air Development Center program. In both new systems, the human pilot will monitor autopilot maneuvers through a cyclic control stick. A different-type autopilot uses auto-tiltation will adjust the cyclic control stick into servo control position.

► Navy UHF Package—Approximately 25% of Navy's aircraft are now equipped with new ARC-17 UHF communications set, replacing previously used VHF. Another 25% are now using VHF, have the necessary UHF wiring and equipment benefits realized and are awaiting availability of UHF equipment. Navy spokesman says that UHF has given no serious maintenance problems then seen concentrated in using VHF.

► N. Y. ATCC Expands Remote VHF—The New York Air Route Traffic Control center plans to install a remote VHF station of Westport, N.Y., similar to stations now in operation at Saratoga and Westport, Pa. (Aerospace Week Jan. 25, p. 36). Saratoga VHF is shared for operations within 50 to 100 ft in 100 ft, handling incoming traffic on Green 5 and Amber 9 arrays.

► New Technical Bulletin—Title description of General Electric's Pro-Seal line of high-reliability sealants and sub-seal vacuum others are described in publication ETD-146A. (Flight Dept. 1 from Ford, Indianapolis 8, 7-1).

► D.C. schedule in 12 different shaft and system and in 21 different end washings are described in detail in Bulletin DCS-7021. (General Electric, Catalog Dept. 418 Van Ness St., Los Angeles 51, Calif.)

► High-speed expansion of the integrated material pump, capable of operation at temperatures of -15 to 121°C, are described in new Avco Corp. bulletin HTM251. (New Bedford, Mass.)

► Magnetic tape, then application and typical applications, are listed in brochure available from Ralston-Danforth Associates (1161 W. El Segundo Blvd., Gardena, Calif.).

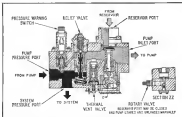
► EASE, using computer, its application and features, are described in Data File 50767 available from Rockwell International, Inc. (Beverly Hills, Calif.).

► Copper wire outboard characterizer and application are described in a new General Electric Bulletin, GEA 5000A. (New York, N.Y.)

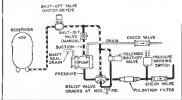
## EQUIPMENT

### New Valve Simplifies Hydraulic Systems

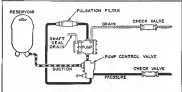
- One-body pump control controls number of parts.
- Vickers unit developed for Super Conquies.



INSTALLATION of Vickers pump control valve in its Model Super Conquies.



CLEAN UP hole pressing correct of motor's hydraulic system, allowing . . .



REDUCTION of agents with electrical switches used by all series.

Vickers, Inc., and Lockheed Aircraft Corp. have developed a single pump control valve for use in its Model Super Conquies.

- Vickers says that the new control valve will:
- Reduce considerably the number of separate units in an aircraft's hydraulic system.
- Eliminate five electrical switches.
- Cut replacement procurement costs by about 60%.
- Give significant weight saving.

Purpose of the valve is to control automatically an aircraft's hydraulic pump delivery of low pressure only the pump's section side when that temperature reaches a pre-determined minimum figure.

► "Unlocked" Operation—Vickers says the valve will "prevent unaided operation of hydraulic pumps in the shock of porting without damage," and the structure loss will not collapse when the pump is shut off.

In case help, the Model AA-6100 pump control valve contains three main pressure sensing switches, pressure relief valve, thermal relief valve, and a safety valve that serves as the pump's section shutoff and thermal shutoff valve.

When the reservoir port is closed, pump may be loaded and unloaded manually.

While Vickers and Lockheed were developing the new valve, Chicago's Southern Air Lines came up with what they considered a simple, easy and inexpensive modification that called for mounting the relief valve directly on each pump. But Cals considered the modification after Vickers had approved it and the engine manufacturer had agreed to the additional engine output required on accessory systems required by the change.

Because of extreme plumbing, wiring and control reasons, Vickers says this pump control valve change is not desirable as a field modification. The change may prove workable at a major overhaul period, however, a spokesman for a large airline suggests.





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production face, the firm claims.  
Chemical Development Corp., Bos-  
ton, Mass.

### Booster Valves

Control valves for follow up boosting  
in purifying systems that operate at  
pressures up to 1,000 psi, are being pro-  
duced by Hydraulic Controls Co.

They provide known flow output and  
are supplied for either manifold mount-  
ing or threaded for pipe or AN tube  
fittings.

The units use Nitriding moving parts  
designed to give long life and smooth  
operation. When small flows are used  
to activate the valves (such as low power  
surges during start) manual sticking  
flows to the valve seat be reduced to  
only light spring action to keep the  
piston in contact with the cone.

Hydraulic Controls Co., 37 Terrace  
St., Roslindale 20, Mass.

### Torque Limit Wrench

A new wrench that limits applied  
torque has been put on the market.

The wrench, jointly developed by  
Rachmont, Inc., and Fitch's Tool Co.,  
has a built-in torque-limiting device that  
prevents automatically at the proper set-  
ting. The tool uses a nondestructive-type  
adjustment for accurate setting and an  
enclosed pressure spring under compen-  
sation of the main torque-limiting ele-  
ment.

The makers point out that the wrench,  
available in either plain-hand  
or combination models, may be used  
anywhere an ordinary wrench may be  
used, but has the torque-limiting func-  
tion as an added advantage. Capacities  
of the torque wrench are 5.75 ft. lb.  
and 16-190 ft. lb. Drive screws 1/4 inch  
and 1/2 inch.

Rachmont calls the new tool HiLo  
Tool, and will sell it direct to aviation  
and other companies accounts it has  
served in the past. Company address: 503  
W. State Ave., San Gabriel, Calif.

The Fitch company, which makes  
parts of the tool, has the exclusive rights  
to sell the wrench, under the company  
name, Fitch, to others and de-  
alership. Address: Fitch Tool Co.,  
Los Angeles 54, Calif.



### Business Executives!

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time off to make blood donations?
- ☐ Has your company given any con-  
sideration to blood?
- ☐ Do you have a Blood Donor Honor  
Roll in your company?
- ☐ Have you arranged to have a Blood  
mobile make regular visits?
- ☐ Do you participate in the  
Red Cross Blood Drive Program?
- ☐ Have you informed employees of  
your company's plan of ac-  
ticipation?
- ☐ Was information given through  
Firm Bulletin or House Magazine?
- ☐ Have you mentioned a Blood  
Fund Campaign in your company?
- ☐ Have you set up a list of employees  
on that official plan can be made  
for scheduling donors?

Remember, as long as one person of blood  
may save the difference between life and  
death for any American... the more the  
better it is!

"He never was much for letter-  
writing when he was in college.  
But he must know how serious  
Machin and I are... now that he's  
off in Korea. Haven't heard from  
him in six weeks. Of course, they  
say 'no news is good news'... but  
I wonder. Maybe he can't write...  
because... maybe he's in a hos-  
pital somewhere. And maybe he  
needs blood. I don't know... but

I'm not taking any chances. That's  
why I'm giving blood!"

Yes, all kinds of people give blood  
—for all kinds of reasons. But  
whatever your reason, this you can  
be sure of: Whether your blood  
goes to a combat area, a local hos-  
pital, or for Civil Defense needs—  
then, needless, perhaps, you will  
know they save an American life!

**Give Blood Now!**

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**P**ressure  
**P**rocessing  
... wherever size of or their  
production is a criterion  
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## Taming Temperamental MAGNESIUM . . . a Cinch with All-Hydraulic H-P-Ms!

The Emerson Electric Mfg. Co., St. Louis, draws this magnesium alloy sheet to a depth of 30". To meet the demands of this difficult job, which calls for accurate control of heat, speed and pressure, H-P-M designed and built the 600-ton all-hydraulic press incorporating an extreme range of accurate, stepless speeds (0" per min. to 100") and pressure control.

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## AIR TRANSPORT

### CAA Airport Aid Fund Is Budget Target

- Salary cuts also likely in paring of expenditures.
- But airways and facilities spending will not be hit.

By Lee Moore

Civil Aeronautics Administration salaries and airport aid funds are prime targets of Commerce Department and Budget Bureau chiefs seeking to reduce the \$1 billion expenditures proposed by former President Truman for Commerce Department agencies in fiscal 1954.

Budget officials feel they may have to cut agency functions to make substantial mandatory savings.

Federal airways operation and facilities establishment are considered absolutely unshrinkable, functions the new cuts may hit. The federal airport program, plans for a new Washington Airport at Eagle, Va., Alaskan airports, coastal tower operation, air traffic airports, special services, such as those intended to penetrate Africa, and safety inspection at first class airports. These are smaller items than the CAA's major budget, which dominates the CAA's expenditures list, because airports are considered vital to national defense and public welfare.

Across the board reductions of salary and expense also are considered likely. But officials concede that heavy cuts of that type would injure since CAA functions, because it will take time for the new Republican management to "climate ready."

■ **Commerce Budget Problem**—Here is the biggest action Commerce Secretary Nicolas Wicks and other officials must to take the load of reducing from CAA's budget, according to a representative source.

Of the \$1-billion Commerce expenditures originally planned by the Truman Administration, \$750 million already has been appropriated by previous Congresses. Some comes out of prior year appropriations but most is for liquidation of prior year's contracts, which would be difficult to cut out now. That leaves \$250 million of new money not to be appropriated for fiscal 1954 expenditures by Commerce agencies.

Of the \$250 million, \$411 million is committed for two CAA items: \$105 million for CAA salary and expense and

#### Proposed CAA Spending for 1954

(All figures in millions)

Not yet contracted (from prior year and new authorizations)

Salaries and expenses	5308.1
Establishment and operation facilities	10.0
Technical development	1.2
Operation Washington Airport	1.3
Construction Washington Airport	9.5
New Washington Airport program	1.4
Federal aid airport program	1.0
Maint & oper Alaska Airports	1.2
Construction Alaskan airports	4.5
Air navigation development	9.5
To liquidate contracts	9.5
Establishment and operation facilities	36.2
Technical and report programs	9.7
Air navigation development	9.7
<b>Total</b>	<b>\$1348</b>

\$5 million for federal aid airport construction.

Cutting these CAA items won't be easy. But other Commerce agency reductions also are difficult, and some are as big as the \$115 million target within the CAA budget headquarters.

Budget officials are going closest to the expenditures side of the budget. Expenditures decrease new spending. So the GOP Administration is going after them first.

■ **Other Commerce Agencies**—The Administration across government funds small agencies among other agencies listed in the Commerce expenditures budget. The Maritime Administration shows \$7 million needed for new ship construction in 1954. War Relocation Authority shows \$17 million in almost all salaries, and substantial would being pocket from interest, salaries and many other vitally dependent items, and their consequences.

In the Bureau of Public Roads, the two largest items are \$42 million for defense ocean routes and \$5 million for Inter-American Highway completion. In the Bureau of Standards' \$9 million total new expenditures, the major item is \$4 million for material research and testing.

Also difficult to reduce are remaining CAA items such as \$15 million for the airways civil air navigation development and \$11 million for establishment of air navigation facilities.

■ **CAA Salaries**—One high official cut

rate CAA says during the \$105-million CAA salaries and expense item, but salary will exceed some administrative functions.

Previous cuts made in CAA's budget already have reduced personnel 24 hours staff operations, such as safety inspection at physical facility, the so-called air tower, requires a minimum of five men put in keep the operation staffed continuously by one man. That is because of the eight-hour shift, 54-day week, annual vacations and sick leave days.

Each item of major additional expenditure added to a facility requires at least one more man. CAA already is paid down to general maintenance on many of its essential services, an official says. Therefore, the Budget Bureau is still probably will have to cut out whole CAA functions in order to get an appropriate cut in 1953-54 expenditures.

#### PAA Switches to DC-3s

Failure of traffic to build up to expectations on Pan American World Airways' Boacerville-Tampico-Mexico City route has caused PAA to replace the 54-70 and Constellation of part in the route last October with 21 passenger DC-3s.

Flight frequency has been increased from four times weekly to a daily except Sunday basis.

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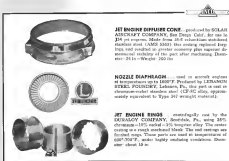
## Why JET ENGINES need Heat-Resistant Alloy Castings

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**JET ENGINE DIFFUSER CONE**—produced by SOLAR AIRCRAFT COMPANY, San Diego, Calif., for use in J47 jet engine. Made from 30-40% nickel-copper alloyed stainless steel (AMS 5555) this casting replaced iron rings and resulted in greater economy plus superior dimensional stability of the part after machining. Diameter 26 in.—Weight 360 lbs.

**NOZZLE DIAPHRAGM**—used in aircraft engines at temperatures up to 1600°F. Produced by LEZARON STEEL POLYNÉSE, Lebanon, Pa., this part is cast in chromium-nickel stainless steel (CF-4C alloy, approximately equivalent to Type 347 wrought material).

**JET ENGINE RINGS**—manufactured and cast by the DURALLOY COMPANY, Swedee, Pa., using 28% chromium—18% nickel—3% tungsten alloy. The center casting is a rough machined blank. The end castings are finished rings. These parts are used at temperatures of 600°-2000°F, under highly oxidizing conditions. Diameter about 10 in.

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on Texas and southeast Kansas areas. General gets about \$1.5 million in rebates each year, CAA estimates, with compensatory pay amounting to about \$500,000 per year for carrying mail. The Board ordered Conrail's application for certificate renewed by seven Westcott, Duane and Okma, Ohio; Pease, Corvallis and Gosselin, Tex.; and Wardell, Kan.

### Central America Planning Own Airline (McGraw-Hill World News)

Guatemala City—Formation of a Central American airline, owned jointly by the five republics, will be proposed shortly by Guatemala and May at a meeting of the Organization of Central American States.

The new carrier would handle air service between Guatemala and the four other member states—Costa Rica, Nicaragua, Honduras and El Salvador—and on international routes out of Central America.

No details of the proposal have been made public, but government sources say the "new venture has been accepted tentatively, although informally, by the other republics."

Central America is served internationally by Pan American World Airways, VACA International Airline and KLM Royal Dutch Airlines. The sources did not indicate whether restrictions would be imposed on the proposed Central America airline in formed.

### Single Pacific Airline Is Urged for Japan

Latest developments in the battle of various Japanese interests for a trans-Pacific airline certificate is a request by Minister of Transportation Matsuyama that three applicants—combinants in form one flag line. The Japanese government plans to invest one billion yen (approximately \$1,777,778) and control 54% of the stock.

The three companies are Japan Air Lines, Japanese International World Airways, and Jale Steamship Co. (Japanese Weekly Dec 6, 1952, p. 84).

JAL operates Japan's domestic routes and has a contract with Transocean Air Lines for trans-Pacific operation. JIWA has a 10-year training, flight and equipment contract with California Eastern Airways. Jale has a contract with KLM Royal Dutch Airlines.

California Eastern vice president Fred Cates told Associated Press on his return from Tokyo that JIWA and Jale are agreeable to a consolidation, but JAL strongly is opposed. JAL, which

already has exclusive Japanese government certificate and backing for direct operation, apparently considers its position strong enough to hold out for an exclusive trans-Pacific franchise.

JAL general manager Ryukichi Ito has announced that JAL plans to start trans-Pacific service (operated by Transocean) to San Francisco with two DC-6Bs about Age 16, changing the route later as number orders of the International Air Transport Assn.

### Cargo Weight Boost Is Early Aim of TAG

Transport Air Group—new airflight association—will ask the Civil Aeronautics Board soon to approve a 5% increase in scheduled cargo weight of DC-6, DC-6 and Constellation cargo flights.

The proposed weight boost previously was turned down by CAA despite strong support by airlines and the Aircraft Manufacturers Assn.

The recently formed TAG has set up a Washington office, and manager L. R. (Mike) Ruckey, former Lockheed cargo engineer, says a staff will be hired in the near future. Ito is a member of "outstanding" executives. Address of the Transport Air Group is 7700 Calhoun Bldg., 1635 I St., N.W., Washington, D. C.

### Australia Planning Jet Liner Airports

(McGraw-Hill World News)

Millions—Special provisions for the building of civil jet airports have been made in plans for new airports being planned by the Australian Civil Aviation Department.

First two airports scheduled for the new design are Exmouth (near Midland) and Mount Ord (near Port Hedland), but no immediate construction is foreseen because of lack of capital appropriations.

Realizing that present landing facilities might endanger persons on the

camp, and create extreme noise with jet plane operations, officials envision a program which would relocate these facilities.

► **How in Wake-In** jet aircraft will land as they now do, but will use a ramp to a special landing upon first. This new jet to be built with the roof of the passenger lounge.

Once at this location engines are out of the plane pulled directly to chassis using from the spine. With loading of passengers and freight completed, the aircraft covers down a ramp to the runway at which point engines are rotated without loss of any to other passengers on the ramp or damage to aircraft which is usually located in the area.

One system with this aircraft position could handle 200 landings and takeoffs a day, Australian Director of Airports & Airports believes.

To cut down noise, officials plan to build an overhead ramp in level of the observation buildings.

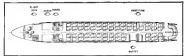
### Frontier's Mexico Routes Are Renewed

Civil Aeronautics Board has renewed Frontier Airlines' Arizona-Mexico route agreements acquired through merger with Azusa Airways. The Board granted the certificate extension "expedited" until May 31, 1955, when Frontier's main route system comes up for renewal consideration.

The Board stated that "continuance of Frontier's present service would not be prejudicial to the public interest in mail or passenger service." The Board adds, "In view of the limited number of persons utilizing Frontier's service, a reduction in this mail payload is deemed to be in the public interest."

The Board therefore dropped Phoenix-Los Angeles and Phoenix-Vancouver, but kept the other services. By 1955, CAA said, a final decision should be possible.

Frontier's total route subsidy for fiscal 1954 is estimated by CAA at about \$21 million.



### SEATING PLAN FOR UAL'S DC-7

Diagrammatic layout of seating arrangement United Air Lines plans for its new Douglas DC-7s. There will be 50 seats plus a four-person lounge at the rear of the cabin.

Seating is two abreast. UAL has ordered 25 DC-7s and expects to get first deliveries next year. The plane will be powered by four Wright Turbo-Compound engines.











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## The Executive Bottleneck

Consolidated Vultee Aircraft Corp. is preparing its men to take on bigger jobs.

The task of training capable executives is necessary in many industries. In the aircraft field where it should be considered imperative, such training has been conducted mainly under wartime conditions of intense war expansion. Convair's Fort Worth Division, however, maintains expansion of an executive development program that it started last year.

Convair is introducing an "internship" plan whereby observers will be assigned to sit in on executive committee meetings to "report some of Convair management to overall division objectives, to the basic factors and considerations in which division actions are based, and to the approach taken to arrive at decisions for such actions," says August C. Eisenstein, division manager.

Under this plan, observers invited to the meetings may be given special assignments by the executive committee.

Another phase of the development program will be initiated shortly when 11 men in positions of superintendent and above will be rotated in their jobs so they can become familiar with various operations in aircraft manufacturing outside of their particular specialty. They will be given special training in communications, as well.

"In the dry of speculation," Mr. Eisenstein says, "we too frequently are prone to become experts in our own little field and fail to understand the broad, overall operation. This executive development program is aimed at correcting that."

We commend the Fort Worth Division's modest plan, and hope it will be adopted and expanded throughout the company and elsewhere in the industry.

The mobilization and losses of those solid days of World War II, when the industry was manufacturing at fantastic rates, were studied carefully after VI Day by a research group from the Graduate School of Business Administration at Harvard. Their report, "Problems of Accelerating Aircraft Production During World War II," was published in 1946. These experts pointed out that top executives in major aircraft companies were "overwhelmed by the day-to-day details and hence were unable to provide the necessary leadership."

As management gained experience in the operation of large-scale organizations, more decisions were made at lower levels and top executives were able to do more forward thinking.

"Not until late in the war, however, were most organizations able to anticipate problems and to set up definite programs to meet them," the report said.

The investigation found that "in a very real sense, management problems... contributed the ultimate limiting factors in the postwar aircraft industry's ability to expand during the war."

These limitations were not so tangible and easy to understand, say, as a shortage of plant space or of aluminum forgings, nor could they be satisfactorily measured. Nevertheless, when the companies were faced overnight into the vast wartime expansion, they could progress only

as fast as the upgraded and outside management personnel could learn their new duties.

"When the war forced the upgrading of most management personnel, it was found that many possessed ability which had, up to that time, been unused and frequently unassessed. Everything considered, their performance was unexcelled."

The report admitted specifically, among management problems which were described as production bottlenecks, to "the failure to train industry personnel in positions to assume more responsible management positions." This glaring factor, the specialists concluded, "would have been reduced by training courses for the lower ranks of management and by rotation of executives between various departments in order to broaden their experience."

That, apparently, is what Convair hopes to do.

## Airports, Life & Death

It probably surprised New Yorkers to learn from Howard S. Gilman, chairman of the Port of New York Authority, that Queens' two major airports alone, La Guardia and Idlewild, support 15,535 persons, with pay rolls of \$25 million a year. By 1956 there will be 36,000 jobs, paying \$160 million. If Newark Airport is added, the 1952 employment total for the three is 16,414 and the payroll \$80 million. By 1965 there will be a total of 62,000 jobs, paying the citizens \$176 million a year.

Those doing "public relations" seem also to keep quite a sizable number of citizens alive, don't they?

## Bureaucratic Bungle de Laxe

Business Week magazine looks at editorial accounts of "bonging" at the Federal Communications Commission for improving some 31 carriers "looking up its bureaucratic nose" on an important application from industry.

The magazine's editorial says it this way: "Leaving officially out of the question the merits of the decision, the fact that the commission took almost two years merely to reach a decision from the moment of consultation, that the commission and its staff as a whole are either oblivious to the welfare of business enterprise or apparently incompetent. There was only one guilty on both counts. President Eisenhower's Administration is pledged to end this type of meddling bureaucracy. It would be a misfortune if the new Administration were to miss opportunity to make an example of the FCC and to instruct other regulatory bodies that their business is to regulate and not to delay."

The FCC is a joke in a dwindling. We refer Mr. Eisenhower to Civil Aeronautics Board. This past week it reopened all over again hearings on the trans-Atlantic Middle East air cargo case. Southeast & Western Airlines filed its application for this route just about 66 months ago—or five years and eight months back. A decision is still a long way off.

The radio industry is lucky. F. E. The Radio Division of Civil Aeronautics on Feb. 11 opened an application of Aerial, Ltd. (now operating from Hawaii) to its scheduled weekly service between the U. S. The decision came less than a year after Aerial filed its request.

—Robert H. Wood

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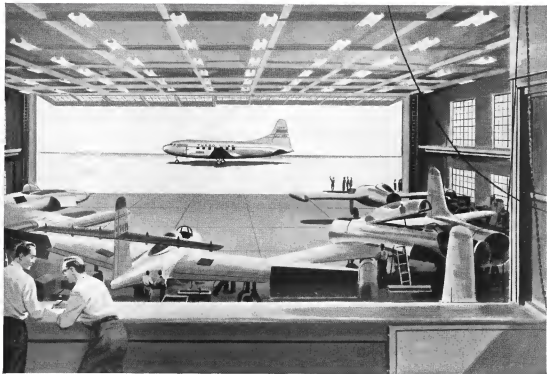
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That's why we have—in addition to *engine* engineers—a group of specialists whose job is to assist aircraft manufacturers in getting the most out of the jet engines we build. This group includes structural designers, aero-dynamicists, stress analysts, engineering test pilots—men with solid experience in all phases of aircraft design and construction.

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apolis, these men install our engines in flying test beds and check engine installations in finished planes. Engine control settings are worked out to fit particular airplane conditions and air intake and exhaust systems are studied to be sure of the best possible environment for the engine.

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